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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/571,867	03/14/2006	Kwang-Deog Jung	DE1676	6953
<div>7590 12/14/2007</div> <div>David A Einhorn Anderson Kill & Olick 1251 Avenue of the Americas New York, NY 10020</div>				
			EXAMINER	
			KATAKAM, SUDHAKAR	
			ART UNIT	PAPER NUMBER
			1621	
			MAIL DATE	DELIVERY MODE
			12/14/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/571,867	Applicant(s) JUNG ET AL.	
	Examiner Sudhakar Katakam	Art Unit 1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 March 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Specification

1. This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claim 1, 5, 6, and 8 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 does not provide the definition of DME. Proper correction is required.

Claims 5, 6 and 8, the phrase "preferably" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Pagani** (US 4,098,809) in view of **Wang et al** (US 2003/0162846 A1), **Dupont et al** (US 2003/0113244 A1) and **Krylov et al** (Catalysis Today, 1998, 42, 211-215).

Pagani teaches a process for the production of dimethyl ether, comprises of feeding a mixture of CO, CO₂ and H₂, to a reactor containing a methyl alcohol synthesis catalyst, and a methyl alcohol dehydration catalyst at a temperature in the range of 200° to 400°C and a pressure in the range of 30 to 500 kg/cm² [col. 1, lines 11-66].

The difference between the instant claims and the **Pagani** is that the **Pagani** fails to teach converting CO₂ rich steam into CO using hydrogen in presence of a catalyst in reverse water gas shift (RWGS) reactor, and then recycling the CO rich stream to step (i) of the claim 1.

Wang et al teach a process and apparatus for the production of synthesis gas, comprises carbon dioxide react with molecular hydrogen over a catalyst in a reverse water gas shift reaction zone to produce a carbon monoxide enriched syngas product [0044, also see Example, and Table 1 for temperature and pressure ranges].

Dupont et al teach a process for the production of carbon monoxide by reverse conversion in the gas phase of CO_2 and H_2 , in presence of catalyst based on zinc oxide and chromium oxide [0011-0012]. **Dupont et al** also teach NiO containing catalyst for the process, in which NiO is 1.2% by weight and Cr_2O_3 is 21.3% by weight [see 0128].

Krylov et al teach the formation of syngas from carbon dioxide using CaO, MnO over the Al_2O_3 [see Results].

In summary, **Pagani** teaches production of dimethyl ether, comprises of feeding a mixture of CO, CO_2 and H_2 , to a reactor containing a methyl alcohol synthesis catalyst, and a methyl alcohol dehydration catalyst. **Wang et al** teach a process and apparatus for the production of synthesis gas, comprises carbon dioxide react with molecular hydrogen over a catalyst in a reverse water gas shift reaction zone to produce a carbon monoxide enriched syngas product. **Dupont et al** teach a process for the production of carbon monoxide by reverse conversion in the gas phase of CO_2 and H_2 , in presence of catalyst based on zinc oxide and NiO over the chromium oxide. **Krylov et al** teach the formation of syngas from carbon dioxide using CaO, MnO over the Al_2O_3 . Please note that applicant's catalysts are known in the art and it is expected to show their catalytic properties results in different reactors, such as reverse water gas shift reactor. So, one would be motivated to develop a one pot reaction process by combining the above references because it is desirable to accelerate the reaction process and avoid secondary reactions using the known catalysts in the art.

It would have been prima facie obvious to combine the DME process of Pagani with the syn gas preparation of Wang et al and Dupont et al and the catalysts of Krylov since

these references teach each of the steps, and their combination would have produced DME with reasonable predictability.

Some limitations of the dependent claims may not be expressly disclosed in the above mentioned references. However, these limitations appear to be drawn to tweaking the process conditions, particularly concentration ranges of the metal oxides in the catalyst. Modifying such methodology is a prima facie obvious because an ordinary skill artisan would be motivated to use known compositions to make the catalyst and to make the process more efficient or explore economical advantages over the other, since it is within the scope to optimize the conditions through routine experimentation.

Conclusion

7. No Claim is allowed.
8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sudhakar Katakam whose telephone number is 571-272-9929. The examiner can normally be reached on M-F 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yvonne Eyler can be reached on 571-272-0871. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

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For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Karl Puttlitz/
Primary Examiner
Art Unit 1621

SK